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Soil Conservation

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SOIL CONSERVATION.

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WELLINGTON BRINK
Editor

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication has been approved by the Bureau of the Budget, July 18, 1955. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

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CONSERVATION BOOKLET.—The Soil Conservation Society of America has published a unique new publication in the form of a well-written, well-drawn, authoritative book; "The Story of Land—Its Uses and Misuse." It is well adapted to use in schools and for distribution to the general public. Within its 16 colorfully illustrated pages are condensed the major facts appropriate to its title. There is much historical material which leads naturally to a discussion of practices in modern soil and water conservation. The booklet is equally suitable for urban and rural readers. Grownups as well as children find it pleasant and exciting reading. The Society reports that the demand for its latest product is very impressive.

—WELLINGTON BRINK

Editors are invited to reprint material originating in this magazine.



FRONT COVER.—This is the Helen King farm in Lehigh County, Pa. The pond is a tenth of an acre in area and seven feet deep. It is spring fed and a fine asset not only for recreation but also for fire protection.

All orders go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Grass Carpets Way to New Wealth

Five hundred farmers and ranchers use their district to install a land program that is bringing increased prosperity to an Idaho County. Everyone benefits, town and country alike.



Governing body of farmers' district: standing—Joseph Heinrich and Donald Beigh; seated—Delbert Williams, Chairman Duane Brent, and James Cahill, Jr.

By HUGH F. EAMES

ABOUT 500 ranchers and farmers in Idaho's Weiser River Soil Conservation District are racking up one and a third million dollars' income each year in new or "extra" income.

A revolutionary shift from dryland grain to grass and livestock production accounts for much of this new income. Intermediate wheat-grass and livestock production are important factors. Drainage, land leveling, and irrigation are big helps also.

What's going on in this district is having its influence on adjacent Payette County, Idaho, and across the Snake River in Malheur County, Oreg. Here there are no districts yet, but farmers and ranchers are independently following the Weiser lead. Some of the 175 farmers in Washington County who have not yet become district co-operators likewise are benefiting from what their neighbors are doing. These extra profits from outside the district itself make Weiser's accomplishments still more impressive.

Gains have come largely through (1) seeding and management of irrigated pastures, (2) seeding of legumes and grasses in dry land (including range), (3) improvement of irrigation methods and practices, and (4) drainage and reclamation of water-logged acreages. In these four categories, the achievements of the Weiser River farmers have meant an increased income of more than \$1,360,000 annually:

2,500 acres of improved pastures that have added \$275,000 annually to values of beef and milk production;

17,358 acres of dryland pasture and range seeding that have brought increased production of beef valued at \$384,000 on 93 farms and ranches;



Carl Bumgarner typifies the Washington County farmer who clicks as a Weiser River Soil Conservation District cooperator. He stands in 6-ton-per-acre corn.

7,000 acres of land leveling, 3,500 acres put under sprinkler irrigation, and 13,000 acres of improved water application, all of which have added \$516,000 annual income at 338 farms, and

7,500 acres of drainage at 205 farms, where annual income has been increased \$187,000.

At least 35,000, and perhaps 50,000, acres of Washington County's dry grainland and unproductive range have been shifted to grass. Population of beef cattle has been boosted at least 10 percent and the number of farms and the productive cropland acreage have been increased. Production of more and better forage and hay, and establishment of adequate stock water facilities in pastures and ranges, have brought spectacular gains in the poundage of meat marketed and in dollar returns. Part of these gains have come from building better quality into the herds.

These improvements and many more under the soil conservation district program, including erosion control and rebuilding of the soil's fertility and water holding capacity, tell why the U. S. Department of Agriculture has recognized the record of the local Soil Conservation Service staff with a hard-to-get Superior Service citation. It lends emphasis to the statement of the district supervisors in an annual report: "High quality technical service of Soil Conservation Service is the backbone of our district program."

Duane Brent, who runs 1,000 head of cattle on a 12,000-acre ranch, has been chairman of the district since 1945. He is the only board member who has served continuously since the district was organized in 1942. He accredits "educational activities" as being the key to district progress. The continuous drive since 1942, he points out, has meant a long, hard pull from which results did not always seem to come as quickly as desired. But every year, he says, there were as many as half a dozen grass, livestock, irrigation, and general farm tours, events arranged for as few as 6 or as many as 100 farmers, to show how improvement could be wrought if land were handled in a different way. Now, he observes, results are piling up rapidly on dry and irrigated acreages.

Also important in paving the way for the current quickening of results, he notes, is Weiser's annual midwinter farm institute and soil conservation day now coming into its ninth year under district and Chamber of Commerce auspices. At the start it drew about 100 people. Each year interest has swelled, and more than 500 people attended this year. The district has made effective use of demonstrations on farms and ranches. Its work has been helped by spreading the services of technicians through opening of a Service field office at Cambridge, by rotation of monthly district board meetings among six communities, by work done in schools and with other groups, by PTA essay and poster contests.



Donald Beigh stands in one of his fields of intermediate wheatgrass.



Frank G. William's beef cattle graze on irrigated pasture. There's a lot of it in the Weiser River Soil Conservation district

"All of this basic activity," Brent says, "stems from teamwork on the part of many people. It also reflects the support received from the SCS plant nursery at Aberdeen, and from the wholehearted cooperation of the county agent, the Agricultural Conservation Program Service and various other local, county, State and Federal agencies."

Washington County has found that, as Brent says: "What is good for agriculture is good for all of us. Everyone benefits when a farmer harvests 3 or sometimes 4 tons of high quality grass from each of many acres that previously didn't produce anything marketable. We all gain when improved pastures and range yield beef and better beef at higher prices. Everybody benefits when annual new incomes like these replace the dwindling dollars that came from producing only 4 to 10 bushels of grain per acre each year or perhaps only every other year."

So it is that when you ask almost any Washington County operator just what good he has gotten out of the district program, he'll stop working even during a rush season and smilingly talk about his experiences. Typical is Archie Wiggins, telling about accomplishments on his 85-acre farm. He got his first help in a group drainage job that benefited 5 farms; later he had assistance in land leveling, drainage, irrigation, and comparable jobs. He continues to be surprised by the results of improvements made in a 10-acre field that "was good only for running a span of old horses." The very first year after improvements in his irrigation system he har-

vested 50 bushels of wheat per acre. It has been doing equally well ever since.

"We small farmers in this area would hate to be without our district," says Wiggins. "It would be a blow to our community because most of us down here have been helped a lot. Technicians do not try to crowd work on us before, or faster, than we can handle it."

W. Clay Sutton, Midvale farmer, as a boy came out of Missouri with his homesteading parents and in 1919 made a start with 280 acres of brush. Today he and two sons, Buhl and Wayne, own and operate about 3,900 acres, of which 1,200 are cropland. He got his conservation start with the old CCC, and by being helped by SCS technicians who taught him that grasses and legumes are better crops than grain on dry land. Clay's program put him in the grassland and livestock business and took him out of enterprises in which he had been so unsuccessful that he lost both land and cattle. He recovered most of the land, which became the nucleus around which to build his 3,900-acre enterprise.

Carl Bumgarner, of Cambridge, is widely known as a producer of purebred Suffolk sheep. He has benefited through land leveling that lets him take lush production from irrigated pastures, hay, and other cropland. In 1953 he leveled 35 acres at a cost of \$1,900, thus increasing his alfalfa yield 2 tons per acre. At \$22.50 per ton this meant \$1,575 added income. Next year he finished paying for the job and started pocketing the profit. Leveling a 28-acre field that contained swales and gullies required moving

of 12,000 cubic yards of earth at a cost of \$1,109. Sweetcorn, the first crop following this work, yielded 6 tons per acre. With corn selling at \$25 per ton and ensilage at \$5 per ton, the net income amounted to \$140 per acre. Grass and hay production in that field has been increased by one-third.

Bumgarner says that saving water is the most important gain from land leveling and the reorganization of his irrigation system. Under the new setup, he irrigates alfalfa once instead of three times. He uses 75 percent less water than previously and saves much time. "Benefits reach far beyond my boundary lines," he avers. "My neighbors are helped through improvements in the water table." Two hundred of his 300 acres are irrigated, 35 being in pasture.

Dewey Alexander is a Midvale area dryland rancher who was encouraged to adopt grass when he got down to a production of but 5 to 9 bushels of wheat per acre where he should have been getting 20 to 25 bushels. "There was no use grinding machinery away for nothing," he comments. "Therefore, I followed the districts' lead and established grain and grass in rotations—a year or two of grain followed by 8 to 10 years of grass. My wheat yields are up to an average of 25 bushels per acre." He keeps about 150 acres of wheat and barley in rotation with grass.

Don Beigh raises beef and hogs at Cambridge. He is a young farmer who began with 20 acres,

now has 400. He runs 75 head of cattle, and a bunch of hogs that turn out surprising profits. In 1944 he didn't have an acre in grass. Now there are 350 such acres.

Ray Roberts, a young farmer at Sunnyside, is just getting started in a land leveling and irrigation program that is unique because there is no outlet for waste water. He has to use all of it, down to the last drop. Some folks say a piece of land can't be irrigated if there isn't an outlet for waste water. What's happening here is an exception to the rule. This last spring, when Roberts had to rush the job so as to get seed into the soil, he put \$100,000 worth of contractor equipment to work and got a \$3,000 job done in a hurry at no extra cost. About 17,000 cubic yards of earth were moved in reversing flow of water. Sweet corn, his 1955 crop, will be followed by sugar beets. He did the improvement work because he was getting only 19 tons per acre of sugar beets instead of 25 tons or more.

Myrl Preston, a part-time farmer has 45 acres at Midvale. He owns a 16-head dairy herd and works 5 days a week in a sawmill. He's been on this two-way job for 10 years. Almost all of his acres now are leveled for irrigation. In leveling a gullied 36-acre piece where 6-foot fills were required, he did the work over 3 or 4 years by using a riding fresno pulled by 4 horses. He dug ditches with a small tractor pulling a farm-made tool. A competent judge



Don Sifton specializes in grass and legume seed production. Here he is in a field of crested wheatgrass planted as a row crop.



Staff working with district, winners of Superior Service Award: Forrest Clossner, in charge; Lael L. Dorman, Joseph T. Harter, and Clare L. Gentry.

last spring said: "I have seen no better grass in Washington County." Preston harvests 50 bushels of wheat per acre as against only 20 bushels previously. He gets other top yields where formerly was bare ground. Myrl occasionally takes a ribbing from his wife, who reminds him that he once said: "I don't believe the district can or will help me." Finally he asked the district's help. And now he declares: "The district and its facilities made our place."

At Sunnyside, Luther Roberts is in the middle of a 4-year leveling job on 150 acres, laid out in 20-acre irrigation units. In the old system in effect when he bought the place water was running in five different direction in fields full of short rows. He is establishing irrigation to fit the need of each individual field, with no common pattern except 640-foot rows. Under the old system, he says: "We were worked to death handling water. Under the new setup, with the help of two small sons, I can change and set siphon tubes in any field in half an hour." His flat ditch system works like a reservoir and is easier to keep clean than the conventional ditch.

Roberts' benefits from his improvements are indicated by what has happened in one of the fields. He planted corn which was disked as green manure after the ears were sent to a cannery. It produced 28 tons per acre of sugar beets the next year. At a total cost of \$130 per acre, he took off a \$200 per acre crop. He remarks: "There was more work watering 10 acres the old way than there is watering 40 acres now."

It was, naturally, a Weiser River Soil Conservation District cooperator who won the 1954 county, State and Northwest award for being Grassland Farmer of the year. The man who won was Milton W. Branch, who recently be-

came chairman of Idaho's soil conservation commission. He has been a director of the National Association of Soil Conservation Districts, president of Idaho State Association of Soil Conservation Districts, and a member of the Weiser River Soil Conservation District board.

In 1929 Branch started operating a 320-acre ranch in Crane Creek area. He now handles nearly 10,000 acres, including 200 under irrigation. He has 1,000 acres in alfalfa and an equal expanse in crested and intermediate wheatgrass and other good grasses. He put up 27,000 bales of hay last year, expects to make 50,000 this year. He grows about 200 acres of grain for livestock, annually feeds out 100 head of beef, and runs 500 to 600 head on 3,600 acres of range where he has a strong reseeding program. He annually knocks out about 100 acres of sagebrush for seeding at a total cost of \$5 per acre. Branch credits intermediate wheatgrass as being the most important factor in his success.

This rancher built nearly a dozen reservoirs for stock water, and now finds that they are no longer filling from runoff. Erosion has ceased and stream beds are becoming well grassed. About the same amount of rain is falling, but well grassed slopes are soaking it up and holding it for use in dry weather. Milt Branch estimates that as many as 50,000 acres of grass have been developed in the district through conversion from wheat, the reseeding of wornout ranges, and other improvements.

Frank Heckler, county agent since 1946, has teamed well with the district. He says it's program "is getting pretty well over the hump and that from now on it will largely be a matter of mopping up." Frank estimates that 30,000 or more acres have "gone to grass" since he came to the county, and that about half of this acreage once was poorly producing dry land. "The district has given the county's economy a big lift," Frank says.

Douglas McGinnis, agricultural sparkplug at Weiser's Idaho First National Bank, says "The Weiser River Soil Conservation District is immensely important in getting Washington County's agricultural industry reestablished on a sound basis." The bank urges farmers and ranchers to become district cooperators and to take marginal land out of grain and put it into grass and livestock operations.



Elton Tarter's first crop of alfalfa: 6,400 bales from 56 acres, an average of 3.7 tons per acre for the whole field. From 22 acres of 2-year-old grass he harvested 2,700 bales, approximately 4 tons per acre.

One of the most faithful and effective supporters of the soil conservation district is Harry Nelson, editor and publisher of *Weiser American* and *Weiser Signal*, weekly newspapers. He has been backing up the district program ever since it started.

The Weiser River district was the tenth among 42 now organized under Idaho State law. It was organized to take over when the CCC was demobilized, after farmers had learned that they could produce more profitable crops than wheat on their dry land. One SCS technician remained to work with CCC cooperators until the district was ready to function in 1943. During the following years many problems were created by shortages of labor and equipment, and the district's complete lack of funds. Through careful management a small fleet of machines and a small operating fund were built up, but it was not until 1947 that the district finally obtained heavy equipment. That came about when it paid a \$1,500 freight bill for moving a \$20,000 cat with angle dozer and 8-foot carryall from Mexico, where the United States had sent it for foot and mouth eradication work.

These two accomplishments by district supervisors set the stage. The bulk of conservation progress in this 700,000-acre area has been made during the last 5 or 6 years.

Weiser's board of supervisors in addition to Chairman Brent are Joseph Heinrich and Delbert Williams of Midvale, James Cahill, Sr., of Weiser, and Donald Beigh of Cambridge. Mrs. Hazel Closner, Weiser, is secretary-treasurer.

(Continued on page 59)



Many of the county's farmers, in groups like this, were converted to conservation farming when they learned they could grow good grass where wheat was uncertain.

DISTRICT PROFILE

TED HEGSETH
of
MINNESOTA

TED HEGSETH of Minnesota mixes soil conservation with just about everything he does. And his activities are many. They include a farm credit business, a grain elevator, a county fair, a soil conservation district, his church, and of course his own 579-acre farm.



County fair exhibit in which Hegseth took a hand.

Ted Hegseth has been chairman of the West Otter Tail Soil Conservation District since 1944. He is immediate past president and area director of the Minnesota Association of Soil Conservation Districts. The effects of his generalship in helping to develop a strong leadership in local districts as well as at state level will be felt for years to come. When he stepped out of his presidency recently, there was an informed and able group of directors who selected a successor from their own number and proceeded immediately to get on with the business of the Association with continuity and dispatch.

Ted for 13 years has been president of the Fergus Falls Production Credit Association. The Association insists that a farm, in order to insure repayment of a loan, have in effect a complete soil and water conservation program.

As president of the Carlisle and Oscar Farmers' Elevator Company, Ted pushes continually for soil and water conservation farming so that better quality of grain, as well as quantity, will be grown by the patrons.

He never misses a chance to show movies on soil and water conservation, particularly to the people in his church. He has developed a small film library of his own on soil and water conservation with his 16mm movie camera.

An excellent soil and water conservation exhibit appears at the local County Fair each year, no doubt partly because Ted is a director on the Fair Board. Responsible for the booth of course, is the West Otter Tail Soil Conservation District.

Three years ago the district set up a soil conservation air tour which attracted 248 persons. For possibly the first time in Minnesota a "live" demonstration of soil erosion in the process of taking place was shown. It was Ted's idea, built by himself. As the picture with this article shows, there were 5 boxes 3 x 4 feet each, set on legs so that there was an 8 percent slope at the surface of a 6-inch layer of soil. A pipe with small holes was attached to the high ends of the boxes. This pipe was connected up with a water pressure system, and a turnoff valve enabled the man in charge to control the flow of water. One box held virgin topsoil, the second hard-farmed topsoil, the third severely eroded soil, the fourth from a field rotated to crops with a high percent of alfalfa brome in the rotation, and the fifth was a stripcropped field on a miniature basis. Applying water to each of these boxes easily demonstrates the difference in infiltration and erodibility under different soil conditions and practices.



Ted Hegseth and family.

Ted and his son, Ted, Jr., are seen in the picture operating the demonstration. Since first shown at the air tour in July of 1952, this demonstration has appeared at the county fairs in the area, has been copied and shown in southern Minnesota, and was used at the 1954 Minnesota State Soil Conservation Field Day and Plow Matches.

Ted is an enthusiastic flier and chooses that mode of transportation whenever practicable. He usually flies to the National Association of Soil Conservation Districts' Convention and various other meetings in and out of Minnesota.

Ted has many community interests. He is a member of the local school board, the sportsmen's club, the Selective Service Board, the University of Minnesota Institute of Agriculture Advisory Committee. He is a master seed grower and member of the Minnesota Crop Improvement Association.

As this is written, he is very busy serving as Chairman of the 1955 Minnesota State Soil Conservation Field Day and Plow Matches, which will be held on the Trosvik Brothers' farm 5 miles north of Rothsay, Minn.

DISTRICT PROFILE

RAY THURSTON
of
MAINE

BACK in 1947, the farmers of Knox and Lincoln Counties in Maine became interested in the establishment of a soil conservation district. Present at one of the meetings held to discuss such an organization was Ray Thurston, of Union. He believed that a soil conservation district would be helpful in promoting farm woodland management and better land use, both of which he felt important to his locality.

When the district was established, Ray became a supervisor. Having already demonstrated his ability in public office during 4 years as Town Selectman, 2 years as a member of the Governor's Council, and in several other local offices, his selection as chairman of the Board of Supervisors was to be expected. Ray is still a supervisor, and still chairman.

Ray Thurston has been farming for almost half a century. He planted his first orchard in



Ray Thurston.

1910, and orchards have continued to be his major enterprise. For a few years he raised canning crops, and the first contour farming and strip cropping in the district were established on his farm. In addition to his orchard, he is presently growing 35 acres of blueberries and doing an excellent job of managing his 50-acre woodland. After 20 years of "farming his woods," Ray is convinced that handling his woodland in the right way is just as important as using modern management for orchards or blueberries.

Ray is a firm believer in cooperation. He finds time to take an active part in the Extension Association and other farmer activities.

He has been active in the affairs of the Maine Soil Conservation District Supervisors' Association ever since it was organized, serving as its president in 1952.

Interest in the state supervisors' association led to interest in the National Association of Soil Conservation Districts. He has attended

five national conventions, sometimes as a delegate and sometimes on his own.

Ray's leadership and his enthusiastic support of the National Association were recognized at the 1955 meeting when he was selected Northeastern Area Vice President. He looks at this new responsibility as one of the most important he's ever had, and he is already planning a program which he believes will stimulate further the district program interest in the Northeast.

—RUSSELL ALBRIGHT

Tomatoes on Contour

DAVE CAMERON grows tomatoes in a grass-based rotation on his farm near York, S. C., in the Catawba Soil Conservation District.

When asked what he thought of grass-based rotations, he said, "It's the only sensible thing. I can double my yields of corn, cotton, or tomatoes by planting these crops after several years of fescue and ladino clover.

He has 20 acres of tomatoes now following fescue and clover. He left contour strips of



Contour strips of grass were left as access avenues when harvesting tomatoes or laying irrigation pipe.

grass as access avenue to use when moving irrigation equipment or when gathering tomatoes. These grass strips are on the contour and so are the rows.



Working with irrigation equipment on grass access strip between tomatoes.

This system of farming helps to conserve soil and water. In addition to getting maximum benefit from natural rainfall by conservation farming. Cameron is irrigating his tomatoes from one of the 11 ponds on his farm.

Technicians of the Soil Conservation Service helped him with his conservation program.

—J. B. Earle

GRASS CARPET WAY

(Continued from page 56)

and Lee Williams is equipment manager. In past years, W. H. Linder, W. Clay Sutton, Dewey Alexander and Travis Tongue of Midvale, Milton Branch of Crane Creek, James L. Warren, Carl Bumgarner and August Jeagers of Cambridge, and James McCrea of Weiser, have served on the board. Linder was the first chairman.

Among the SCS technical staff members who have worked with district cooperators for as many as 13 years are Forrest Closner, who heads the unit; Joseph T. Harrer, engineer, and Clare L. Gentry, conservationist.



Sarah Ashe and top quality tomatoes grown in grass-based rotation.

He Rebuilt Circle G Ranch



Most Circle G land looked like this when Germany bought it.

By J. H. CHEEK

E. B. GERMANY changed an unsightly, non-productive landscape of hills and hollows covered with tickle grass, poorjo, and scrub oaks into a productive, picturesque panorama of soil building grasses and legumes.

Germany is president of the Lone Star Steel Company and a well known rancher of Van Zandt County, Tex. He accomplished his feat in the last 8 years on his 325-acre Circle G Ranch 3 miles south of Grand Saline.

In 1946 when Germany acquired the ranch it was carrying 15 head of scrubby livestock that looked to be as underfed as the land was overgrazed. Today 110 head of sleek Angus and Brangus cattle graze 300 acres of crimson and hop clovers, vetch, sericea lespedeza, dallis and bermudagrass. Some 60 tons of hay are cut and put in the barns each spring.

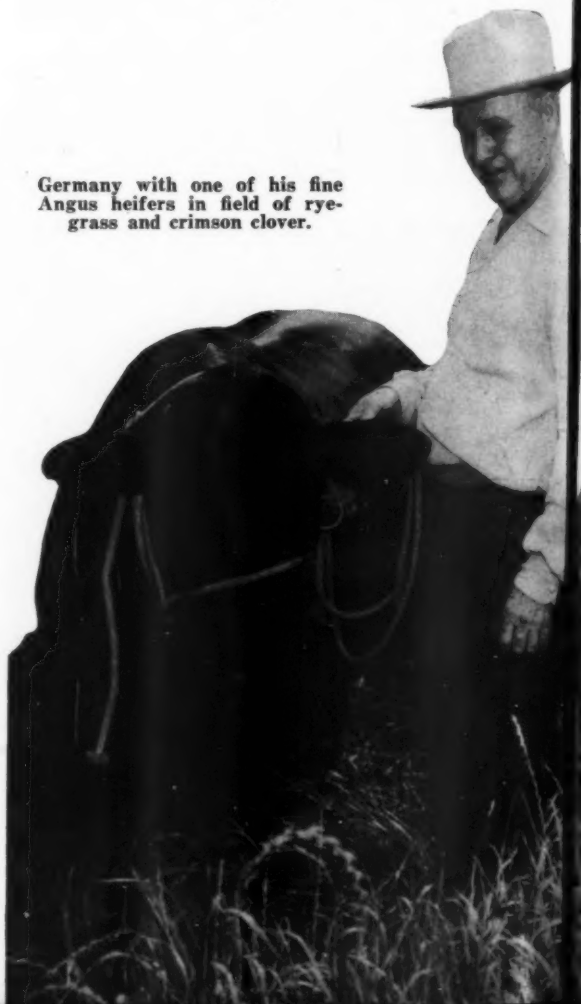
Today Circle G livestock are in such fine condition they look like show animals. Some of them are. R. A. Davis, manager of the ranch, has won several blue ribbons at stock shows in the Southwest lately with cattle from this spread.

When Germany purchased his place the neighbors thought it was the poorest piece in Van Zandt. But Germany explained: "I did not buy this ranch to build a display of fine houses, barns, and fences, but to rebuild its wornout soils. I believe I can do that in a reasonable length of time and make a fair return on my money while doing it."

At once he became a cooperator with the Neches-Sabine Soil Conservation District and through it, sought the assistance of the Soil Conservation Service in soil, water, and plant conservation.

The technicians first made a soil survey of the entire ranch. The information thus obtained was the basis for the recommendations put into

Germany with one of his fine Angus heifers in field of ryegrass and crimson clover.



Note.—The author is work unit conservationist, Soil Conservation Service, Mineola, Tex.

the ranch plan. Davis, the manager, translated the plan into a living, growing thing. He said: "I like it because it is all written down on the aerial photograph, field by field. It is workable, concise, and easily understood."

The plan that Davis liked so well called for clearing 200 acres of timber and seeding it and another 100 acres to adapted grasses and legumes. The other 25 acres were reserved for farmstead, lakes, and spots of woodland for livestock and wildlife shelter. Cross fences were recommended for controlled grazing. Ponds were located at vantage points for stock water. Recommendations were made for stocking the ponds with fish and planting shrubs for quail food and cover. The original plan was



Ranch Manager R. A. Davis, Conservationist J. H. Cheek, and Circle G owner measure vetch and hop clover in a 60-acre field.



Angus cows and Brangus bull on crimson clover at Circle G Ranch.

revised to include an irrigation system as insurance against droughts, and to provide for hives of bees to be placed in the fields of vetch and clover for pollination and to furnish honey for the table. Manager Davis has followed these recommendations meticulously.

Among the unique things that attract your attention at Circle G is a fence grown from thorny multiflora rose that defies passage of everything but rabbits and they have to be awfully careful to get through!

Then there are several coops of quail—51 pairs in all—that raise about 600 birds each year. Some are turned loose to feed and hide in the multiflora rose and other wildlife habitats. The rest are not so lucky—they go to the deep freeze!

Under normal conditions a 10-acre lake that lies adjacent to the farmstead furnishes enough fish for the Germany's table—even to the third generation.

Commercial Fertilizers for Conservation Farming

By J. RICHARD ADAMS

MANY conservation practices depend to a great extent on the use of fertilizers. Application of the primary plant nutrients, nitrogen (N), phosphoric oxide (P_2O_5), and potash (K_2O) is often necessary to establish and carry the luxuriant cover crops needed to conserve the soil. Liming materials and some form of sulfur are frequently used to supplement the secondary elements calcium, magnesium, and sulfur supplied by the primary nutrient materials. Trace elements must be added in certain localities to overcome deficiencies, particularly in boron.

With one exception, consumption of each of the three primary nutrients in agriculture has increased annually since the fiscal year ending June 30, 1943. The phosphoric oxide used in 1953-54 was about 1.3 percent less than in 1952-53. The mounting consumption of plant nutrients has been met by increasing the production and the nutrient content of established fertilizer materials and mixtures, and by using materials new to the industry. At the same time the physical properties and methods for the application of fertilizers have been improved. These developments have aided in simplifying fertilizer application problems and have helped to hold fertilizer prices at a low level relative to the other commodities the farmer has to buy.

Consumption of all fertilizers increased 104 percent from 1942-43 to 1952-53 and then dropped 2.7 percent the next year. The primary plant nutrient content increased from 2,345,000 tons in 1942-43 to 5,896,000 tons in 1953-54, an increase of 151 percent, and the concentra-

tion increased from 20.5 to 25.9 percent. The higher concentration in 1953-54 offset the drop in fertilizer consumption below 1952-53 to such an extent that the tonnage of plant nutrients consumed in 1953-54 was greater than in the previous year.

Much of the increase in concentration has been brought about by the greater use of the higher analysis nitrogen materials:—ammonium nitrate (32.5-33.5% N), ammoniating solutions (37-49% N), and anhydrous ammonia (82% N). Domestic use of fertilizer-grade ammonium nitrate was first reported in 1943. Subsequently the consumption of this material has shown a marked increase. Thus 846,252 tons were applied directly to the soil in 1952-53 and about 500,000 tons were used in the producing plant, primarily in the manufacture of the aqueous solutions of ammonium nitrate and ammonia (ammoniating solutions) used in the production of mixed fertilizers.

Anhydrous ammonia, as such, was first applied to the soil as a fertilizer in irrigation water in the early 1930's. Its use for direct injection into the soil did not come into prominence until after World War II. It is estimated that 22,397 tons were used for direct application in 1946-47. The quantity so used in 1953-54 amounted to 350,474 tons.

Originally, ammoniating solutions and aqua ammonia were used only in the manufacture of mixed fertilizers. Their use enabled the manufacturer not only to formulate mixtures to contain 3 to 4 percent of nitrogen from relatively less expensive and more concentrated materials than had been used previously but also to improve materially the physical condition of the finished product. Recent advances in ammoniation and granulation techniques now make it possible for the manufacturer to produce mixtures containing 8 to 9 percent of nitrogen from

Note.—The author is in the fertilizer and agricultural lime section, soil and water conservation research branch, Agricultural Research Service, U. S. Department of Agriculture, Beltsville, Md.

ammoniating solutions. The farmer may now apply ammoniating solutions directly to the soil with equipment similar to that developed for the injection of anhydrous ammonia. Other aqueous nitrogen products, containing 21 to 32 percent nitrogen and consisting of solutions of ammonium nitrate alone or with either sodium nitrate or urea, are also on the market. They are used for direct application and since they contain no volatile ammonia they may be sprayed on the surface of the soil with no significant loss of nitrogen. These modern developments have increased the use of solutions, including aqua ammonia, for direct application from 21,911 tons in 1949-50 to 191,592 tons in 1953-54. This is in addition to the increased quantities of ammoniating solutions used in the manufacture of mixed fertilizers.

No. 8

This is the eighth of a series of articles to appear from time to time in explanation of the various phases of research being conducted by the Department of Agriculture on problems of soil and water conservation.

Urea is used in the form of ammoniating solutions and as a solid. Urea ammoniating solutions were first produced domestically in 1932 and solid urea fertilizer (42-45% N) in 1935. This use has been restricted by limited production facilities. Three new plants are now in production and a fourth is under construction with a total rated capacity estimated to be more than 600 tons of urea a day.

Among the newer materials that may find an important place in the fertilizer industry are urea-formaldehyde products (urea-form), diammonium phosphate and calcium metaphosphate. Urea-form is a new, low-solubility, and high-analysis (37% N) fertilizer. It was developed in the U. S. Department of Agriculture and is composed of the reaction products of urea and formaldehyde. The product has excellent physical properties as compared with the high-nitrogen materials commonly used. One application will supply the entire nitrogen requirements of long-season crops. Limited quantities are available as specialty fertilizer for

turfs and ornamentals. Diammonium phosphate is a high-analysis material containing approximately 21 percent nitrogen and 53 percent available phosphoric oxide. It is water soluble and is one of the materials used in formulating liquid fertilizers and starter solutions. Several companies are producing this material and it is estimated that the annual production is approximately 20,000 to 30,000 tons. The third of the newer materials mentioned is calcium methaphosphate which contains approximately 63 percent phosphoric oxide. This material was developed and has been produced by the Tennessee Valley Authority. Production, in terms of phosphoric oxide, increased from 2,234 tons in 1939-40 to 34,907 tons in 1953-54. It is essentially a direct application material; 81 percent (28,289 tons) of the 1953-54 production was applied directly to the soil.

The trend in the superphosphate industry is to produce more triple superphosphate (45 percent P_2O_5) and less normal superphosphate (20 percent P_2O_5). Thus, in 1945 triple superphosphate accounted for only 7.8 percent of the phosphoric oxide produced as superphosphates as compared with 23.9 percent in 1954. Sizeable quantities of potassium chloride, the major source of fertilizer potash, were formerly marketed as a 50-percent grade. This grade has been almost entirely replaced by the 60-percent grade.

The fertilizer industry is adopting modern and improved techniques for the production of more economical high-analysis mixtures with better physical characteristics. The nitric acid or nitric acid-sulfuric acid treatment of phosphate rock is being used by at least two companies in this country for the direct production of mixtures. The featured products are 12-12-12 and 14-14-14 mixtures. Research in the Department of Agriculture has contributed significantly to the development of processes for the granulation of mixed fertilizers. Very few new fertilizer plants are constructed without granulation facilities and they are being incorporated in many of the older plants. The Tennessee Valley Authority has recently developed a continuous ammoniation process which is finding considerable application in the granulation of mixed fertilizers.

Fertilizer companies are now selling many

grades of fertilizer mixtures to the farmer in bulk and in some cases actually formulating the product to the farmer's specifications. The fertilizer is loaded on a truck, taken to the field and immediately spread. The farmer derives economic benefits from this practice.

Considerable interest is being displayed at the present time in liquid mixed fertilizers but their use is still quite limited. It is estimated that approximately 27,000 tons of liquid mixed fertilizers were consumed in 1953 and of this quantity about 22,000 tons were used in California. Such fertilizer solutions are readily applied either through irrigation systems or directly to the soil. Local oil distributors are beginning to use their fuel oil truck fleets during the off-season to custom fertilize city lawns with dilute solutions of fertilizers.

Recent improvements in application methods and equipment tend to make fertilizer application more flexible and convenient for the farmer. Application equipment for liquid fertilizers has been developed and is now readily available. In many localities custom applicators fertilize with liquid fertilizers or apply solid fertilizers by airplane. Metering equipment on lime spreaders has been refined to enable the farmer to use

the same equipment for spreading bulk fertilizers. Multiple compartment distributors that are on the market make it possible to apply separate nitrogen, phosphoric oxide, and potash materials, either liquid or solid, in any desired ratio. The multiple-compartment spreaders enable the farmer to apply the most suitable ratio of plant nutrients to the soil and to readily change the ratio as the need arises.

Fertilizer technology in recent years has done a great deal to lighten the farmer's load. Higher plant-nutrient concentration tends to maintain the low-price level of fertilizers through savings in the cost of bags, freight, and handling charges per unit of plant nutrient. Granulation gives the farmer a product that is easier to drill and can be more uniformly applied. Liquid sources of nitrogen supply the farmer with low priced nitrogen which can be handled with little manual labor. The farmer saves when he buys bulk fertilizers because of the elimination of bags and reduction in handling charges while the purchase of separate materials for application in multiple-compartment distributors eliminates the mixing charges. Custom application is advantageous to the farmer because it relieves him of one task during his busy season.

Soil Stewardship Was Theme

Georgia ministers meet to plan the pulpit's part in helping the cause of soil and water conservation.

By GORDON WEBB

MERCER University, founded 122 years ago in a cottonfield and primarily intended to train rural ministers, continued its close association with the soil last spring when ministers from 30 central Georgia counties gathered there for a conference on soil and water conservation.

At this conference in Macon more than 600 people, most of them ministers, heard three leading Georgia clergymen ask that church congregations be inspired to soil stewardship.

The dependence of rural churches on productive land around them, and in turn the dependence of urban churches on rural churches to swell their congregations, was stressed by Dr. Louie D. Newton, pastor of Druid Hills Baptist Church, Atlanta, and American vice president of the Baptist World Alliance since 1937.

Dr. Newton, who preaches one sermon every year from a pulpit decorated with a plow stock and products of the soil, to remind his Atlanta congregation of its ties with the soil, asked for a show of hands of ministers reared on the farm. Nearly every minister raised his hand.

"Soil conservation is primary business," the Baptist leader said.

In reminding the clergymen of the church's obligation to the land, Dr. Newton recalled that Mercer was opened in 1833 as "a manual school for training ministers." The first gift toward founding the school was \$2,500 from a Savannah, Ga., jeweler, Josiah Penfield. And the second gift, of \$40,000, came from a minister-farmer, Jesse Mercer. With these donations and funds raised by Baptist congregations, 1,800 acres in Greene County were bought for the campus. The site was named Penfield for the jeweler; and the school Mercer for the farmer-minister. In 1871, Mercer was moved to Macon.

Dr. Cecil A. Thompson, professor of evangelism at Columbia (Presbyterian) Seminary, Decatur, emphasized that soil and water conservation are a community undertaking.

"A farmer can't practice conservation on his farm if the man up the creek does not also carry out the work," the Presbyterian minister said. "We are all dependent one upon another. It is true with the church as well as with the farm. All of us are in it together. To build a strong nation and a great people we must have a sound agricultural policy.

"This matter of conservation is bigger than we think. The word 'conservation' doesn't begin to cover what the conservationists are doing."

Dr. Thompson said that conservation on his own small farm is actually "transformation—almost creation." He declared that in the last 10 years, "You can see that a miracle has happened in Georgia, has happened all over the South—all over the country."

Bishop Arthur J. Moore of the Georgia Conferences of the Methodist Church, Atlanta, told the soil conservation district supervisors present: "We of the church are deeply concerned with what you are doing. The church must be concerned with a larger mind, a better community, and that is what you are building. This preacher believes your work is vital and indispensable."

Telling of his visits to the "hunger countries," the Methodist leader said the Chinese wasted their natural resources, became "poor and unhappy, and the communists found them fertile soil."



On campus at Mercer University: Supervisors A. L. Branan, Jack Peed, Houser Davidson, C. A. Duggan, R. F. Burch (chairman), M. T. Riner, and H. M. Simpson; at extreme right is Dr. Frank King, director of the Coastal Plain Experiment Station.

George F. Powers, president of the Georgia Association of Soil Conservation District Supervisors, appealed to the ministers for their help in conserving land and water resources. Explaining how districts are organized and governed by local farmers, Powers said: "We supervisors are paid in the same way and in the same amount as your board of deacons or board of stewards."

Supervisors of four central Georgia soil conservation districts and President George A. Connell of Mercer invited the ministers from 30 counties to the conference in preparation for National Soil Stewardship Sunday, May 15. Reports in June showed 787 Georgia ministers discussed soil stewardship before congregations totaling 80,525 people.

The conference ended after the ministers and other guests fully sampled some of the products of the land—typically good Georgia barbeque with all the trimmings.

The program was arranged by Dr. McLeod Bryan, professor of sociology at Mercer University; Rev. Guy Hutcherson, Methodist minister, Perry; and Frank T. Denham, field secretary of the Georgia State Soil Conservation Committee, Eatonton. W. F. Hall, a member of the State Soil Conservation Committee, of Sparta, presided.

REMINDER.—Friends of conservation can make more friends by giving subscriptions to this magazine; price \$1.25 per year, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Decade of Progress on the Plains

Where the winds blow and the soil is salty, conservation brings many problems to a happy end.

By MARTIN C. LUND
and MILFORD THOMPSON



Conservation leaders happy over advances of past 10 years: Martin C. Lund, SCS technician; Joe E. Adams, supervisor; William R. Page, formerly county agent and now board secretary; George Johnson, supervisor; and Frank Dubuque, supervisor.

LYING west of the Red River of the North, the 19 North Dakota townships included in the Grand Forks County Soil Conservation District are all within the original basin of glacial Lake Agassiz. The district is now more than 10 years old. Soils vary from light sandy beach soils on the west edge, to heavy textured silts and clays along the river. About 200,000 acres

Note.—The authors are, respectively, work unit conservationist and conservation aid, Soil Conservation Service, Grand Forks, N. Dak.



Field and farmstead windbreaks on the flat lands of glacial Lake Agassiz are protecting soil and crops from damaging winds. In addition, feedlots and farmyards are protected from drifting snow.

—almost half the district—are affected by varying degrees of salinity. Some soils can be used only for native hay land and pasture.

The land is generally flat with many small depressions and ridges that tend to retard runoff of snowmelt and rainfall. Accumulation of moisture in these depressions has aggravated further the salinity condition of the adjacent higher ground. With nearly all of the district affected by this problem, the supervisors gave top priority to the establishment of outlet drainage systems. Since 1944 more than 200 miles of outlet and farm drainage systems have been constructed, requiring 1,200,000 cubic yards of excavation. These drains have benefited about 75,000 acres of agricultural land and put thousands of dollars of additional profits in the district cooperators' pocketbooks. Local contractors working in cooperation with district supervisors and farmers have done most of the ditching.

In 1947 the district purchased a crawler-type tractor and scraper unit to be used for jobs too small to interest the contractors. Since then it has purchased a special type rock digging rake, which it rents to cooperating farmers to remove large glacial boulders. Glacial boulders inter-



Farm ditch newly seeded to alfalfa and brome grass with barley as nurse crop. This ditch drains adjacent flat fields or potholes. When grass is well established, there is little erosion. A useful practice in combatting damage from flooding by snowmelt, spring and summer rains.

fere with cultivation on about 100,000 acres of land in the district. Thus far, district cooperators have removed rocks and nuisance trees from about 6,000 acres of farmland. Successful use of the rock rake has inspired local contractors to obtain similar machines to help remove field obstructions.

The district is relatively treeless. To obtain greater protection against the winds, district cooperators have been encouraged to plant farmstead and field windbreaks. In 10 years, 1,019 acres of trees have been planted for both field and farmstead protection. Planted in one row, they would make a shelterbelt 509 miles long. Farmstead windbreaks are especially valuable in this windswept valley as they protect against drifting snow and prevent the large drifts common in unprotected farmyards following severe winter storms. Much less fuel is needed to heat homes with well developed windbreaks. Care of livestock in tree-protected feedlots reduces costs considerably. Field shelterbelts protect open cropland from wind erosion during late fall and early spring months, as well as growing crops from hot summer winds.

Plantings in the district include fruit trees to provide the family its own supply of plums,

crabapples, sand cherries, currants, Chinese cherries, and other fruits. Game and song birds thus find much food, shelter, and nesting cover in this valley.

Tillage practices to combat wind erosion are imperative. In this flat valley, with its heavy textured soils, most of the plowing must be done in the fall. Stubble mulch tillage has been encouraged, and hundreds of acres receive this type of conservation treatment each year.

Providing adequate stock water has been a problem for many farmers. Deep wells supply artesian water, but some are too salty for livestock. Wells have been permitted to flow uncontrolled without suitable outlets and have already ruined many acres of land. To provide needed stock water, many surface storage dugouts have been constructed in pastures away from farm headquarters, and many more have been constructed at headquarters, to provide water necessary for summer and winter use.

In the early days of the district, it was agreed that conservation education in the public schools was a necessary part of the district's program. The district supervisors sought the assistance of the bankers in the county to obtain money for cash prizes for interest-stimulating conser-

vation contests. About \$1,000 has been furnished by the banks to finance five such contests in the past 10 years. These contests for 7th and 8th grade pupils have stressed conservation in such activities as essays, scrapbooks, jingles, and posters. The county superintendent of schools and the agricultural extension agent have been most cooperative in carrying out an effective education program. About 150 entries were received in last year's contest.

The Eastern Grand Forks County Soil Conservation District, in cooperation with the other district in the county, has provided scholarships to encourage teacher attendance at summer conservation courses and workshops. Twelve teachers in the county have been given \$25 scholarships.

Further adult education in conservation is being accomplished through cooperation with local civic groups in farm tours, farm family night meetings, and special programs for urban groups. Use is also being made of our daily newspaper in featuring "success stories" of district cooperators. Then, too, our local radio stations provide time for monthly radio broadcasts by technicians of the Soil Conservation Service, our agricultural extension agent, the district supervisors, and others.

The supervisors feel that the district is serving its 407 cooperators well. The goal is a better place to farm and to live.

Camp School for Sixth Graders

By ROY E. BALLARD

AT Earl-Anna, the Burbank YMCA camp, located in a beautiful setting in the exquisite Tehachapi Mountains about 7 miles southwest of Tehachapi, Calif., conservationists for tomorrow were being developed. The occasion was the one-week, sixth-grade camp of the Tehachapi Elementary School.

Note:—The author is soil conservationist, Soil Conservation Service, Tehachapi, Calif.

John Horton, the camp director, was assisted by sixth grade teachers Mrs. Lola Oxford and Mrs. Gertrude Phelps, and by the vice principal, Thomas Feeney, as well as by some of the parents who spent the nights at the camp.

Before camp each pupil was given a medical



Frank Walker stresses importance of preventing fires.

examination. On Monday morning, the pupils were transported to camp by bus, and remained until Friday.

The boys were quartered in one camp, the girls in another, a short distance away. There were eight pupils and one supervisor to a shelter. Each pupil assumed certain responsibilities, such as keeping their camp clean, and helping in the mess hall. One day during the week the campers assembled in an outdoor classroom provided by nature. Here a team of specialists guided the youngsters in exploring the alluring subject of conservation of natural resources. It was a co-operative enterprise. The instruction was provided by the Kern County Fire Department, the Kern County Department of Agriculture, and the Soil Conservation Service.

Fifty-eight pupils were in class in addition to supervisors and leaders. During the morning session half of them were studying conservation while the rest were engaged in other activities. In the afternoon the groups exchanged places. Four conservation sites were selected for study. Four groups rotated from one site to another in sequence.

Gil Martinson, at area No. 1 explained the correct method of planting as each group of pupils actually planted a tree. Result: the youngsters learned, in the effective school of experience, that certain locations were better



Good cattle thrive on good pasture, as here on the Evren Youngberg dairy farm.



Gil Martinson shows youngsters how to plant a tree.

suited to the growth of trees than to the growth of other crops. They also learned that it was important to replant many exposed areas to prevent the loss of soil by water or wind erosion.

When the pupils moved to position No. 2, D. J. Vanderwal of the Soil Conservation Service helped them to get acquainted with the plants and trees that were growing around them. Soon they learned to recognize one tree as a pine and another as a fir. They were shown that trees differed, that some grew on high mountains and others in low valleys.

At site No. 3 sixth grade teacher, Mrs. Lola Oxford, and her pupils listened attentively to explanations made by Brad Krauter of the Kern County Department of Agriculture. After Brad showed them some of the insect pests common to local forests, they searched diligently under a few dead trees to see if they could find any

of the insects that might have caused the trees to die. They came to realize the necessity of controlling insects to save forests.

Chester R. Ingrils, high school district superintendent, and Claude L. Wells, elementary district superintendent joined the group at location No. 4, as Frank Walker of the Kern County Fire Department pointed out what an important role each of them played in conserving the forests by applying safety rules to prevent fires. He convinced them that planting trees was only the



Brad Krauter talks about tree-killing insects. Mrs. Oxford is at right.

beginning. Proper forest management and protection, he emphasized, were necessary to insure complete development.

An additional but not final chapter was written to the drama by the pupils themselves the following week back in the classrooms. There they made placards, wrote stories and prepared notebooks. Thus, each pupil recorded in indi-

vidual style the highlights of his or her experience at camp, preserving for the future the happy memories of that week in camp.

The degree of retention displayed by the boys and girls, on questioning 9 months later, was remarkable and thrilling. Said one: "It's necessary to keep hills covered by trees or other vegetation to prevent erosion." Said another: "It's important to plant trees on uncovered areas where crops won't grow." A third statement was: "It's desirable to keep streams clear to prevent floods."

Mrs. Oxford summarized the children's experience in these words: "The broad field of conservation was made forever more impressive and more memorable to the child who obtained a knowledge of the earth, sky, wind, and weather in the intimate, natural setting of a camp in the mountains."

BEEF AND CHRISTMAS TREES.—On their ranch near Eureka, Mont., growing Christmas trees has been a major operation of the Stoken Brothers for the past 22 years. They run beef cattle and do some logging but their favorite occupation is producing Christmas trees. The Stoken Brothers cooperate with the Lincoln Soil Conservation District.

The first Christmas trees were cut in 1932 when 5,000 bales (about 25,000 trees) were marketed. The price then was from 12 to 16 cents per bale and the cash return was around \$500. In 1954, about the same number of trees were cut but the average price received was about \$1.50 per bale with a gross income of about \$7,500.

—WILLIAM D. SHELLEY

HE GREW A HOUSE.—The William Cumming farm, near Camino, Calif., contains not quite 140 acres. What isn't in well-managed orchard, is in an 80-acre forest.

A few years ago the Cummings wanted a new house. This entailed SCS technical assistance and the use of the portable sawmill owned by the El Dorado County Soil Conservation District. A fine, modern, and spacious house resulted and the woods are in better shape than ever to grow another crop of wood.

SUITABLE INCENTIVE.—The Bennett County (S. Dak.) Soil Conservation District, recently appropriated the sum of \$32.50 for 26 subscriptions to SOIL CONSERVATION Magazine which are being presented to entrants in an essay contest conducted by the district. The announcement came in a letter from Lawrence Petersen, treasurer.



Scaling trees on Round Grove ranch.

TREE HARVEST ON RANCH.—In 1954 Frank O'Connell, owner of the Round Grove Ranch Company and a cooperator of the Broadwater (Mont.) Soil Conservation District, requested assistance in connection with Douglas-fir stands on his 10,000 acres of woodland and grassland.

Soil Conservation Service technicians recommended that mature trees be harvested so as to release younger and healthier trees. A mill was set up. Mature timber will be harvested over a 7- or 8-year period. There is year-round employment for eight men. Lumber is sold rough and planed at nearby markets.

—CLAYTON E. OGLE

HABITUAL WINNER.—Peden Gaston, a cooperator with the Spartanburg (S. C.) Soil Conservation District, was recently presented a Balanced Farming Award by the South Carolina Extension Service. Gaston has developed and applied conservation practices on his whole farm, with the assistance of SCS and other technicians.

Gaston also has been a regular winner of soil conservation awards. In the 1951 soil conservation contest sponsored by his district he won first prize for "best job of conservation farming," for "best strip rotation," and "best woodland management." Likewise, his community—Green Pond—won first place in the same contest.



REVIEWS

OUR NATIONAL FORESTS. By Bernard Frank. 238 pp. Illustrated. 1955. Oklahoma: The University of Oklahoma Press. \$4.

THIS is a story to be read with pleasure and pride. It is the story of the American forests—their character, their beauty, their intrinsic value to the Nation, and the responsibility we all bear to them.

Every page lives and glows. The author is there walking the forest trails with a pack on his back. And with him moves the great tradition of the U. S. Forest Service, mighty battler for our tree-studded public domain.

This is an exceedingly well-written book. The author is forthright, skilled in perspective, and he does not strain for effect. He meets controversy head-on without bigotry. And he *informs*. Surely, there has not before appeared between two covers so complete an account of our National Forests—their location, their extent, their purposes, their uses, their composition. Whoever seeks the refuge of woods and wildlife and mountains will be grateful for Bernard Frank's 40-page "National Forest Recreational and Scientific Resources" which constitutes Appendix I at the back of the book.

The chapter headings are a fair indication of the content: How It Came About, Profit, Pleasure—and Something More, Within These Borders, Ten Thousand Loyal Servants, and Questions for the Future.

Photographic illustrations are well chosen and widely representative. At the front of the book is a two-color line map which indicates the annual runoff in the forests and which tends to establish a conservation consciousness which projects itself from beginning to end. For Bernard Frank is at least as much a conservationist as he is a forest technician. Every chapter, nearly every paragraph, speaks for the stewardship of soil and water.

Frank dwells much on the policy of "multiple use"—a policy which "encourages the sale of commercial timber to private enterprises, sheep or cattle grazing by farmers and ranchers, and other uses consistent with the need for protect-

ing the watersheds against erosion and muddy water flows. It encourages favorable fish and wildlife conditions. It provides for roads and trails to reach forest fires quickly, and to permit readier access to the forests by loggers, hunters, and fishermen. It promotes the development of picnic, camping, winter sports, and summer home sites. Right of ways are also furnished for irrigation canals, county or state highways, electric power lines, gas and oil lines, and sites for hydroelectric power plants and other water developments. The forests are also subject to mineral exploitation under federal laws enacted long before the Forest Service was established, and at a time when public concern over doubtful mining claims and unnecessary damage by mining had not yet crystallized."

Justice William O. Douglas wrote the foreword. "This volume," he says, "gives a rounded account of what is happening to our topsoil the nation over. It tells what the United States Forest Service is doing about it. It shows how communities, large and small, can aid in conservation measures and, with planning, avoid the desolation to which they are presently doomed."

—WELLINGTON BRINK

LAND JUDGING. By Edd Roberts. 120 pp. Illustrated. 1955. Oklahoma: The University of Oklahoma Press. \$2.50.

IT has been my privilege to observe first hand the development of land judging as an educational method for increasing knowledge about the use and treatment of the soil. Edd Roberts is a recognized leader in this land judging development, a leadership which grew from the conviction that a technique comparable to livestock judging would be effective and from an intensive personal experience in supervising land judging events in Oklahoma. He was presented a superior service award from the U. S. Department of Agriculture in recognition of his work in the development of this method.

In a simple forthright manner, "Big Edd" discusses the importance of soil, how to judge land by physical characteristics, the land judging score card, the conduct of land judging contests, and the aid and stimuli that make land judging successful. Simplicity of presentation

is always seen in the language and visual aids which he uses in the field himself.

Land appreciation schools and land judging are popular now everywhere. Although exact figures are not available we believe that more than 100,000 people participated in such schools in 1954 and the method is in use in at least 30 states.

It should be pointed out that the principal values of land judging are gained where actual land use and treatment can be applied to local farms and ranches. The lively interest in state, regional, and national land judging contests indicates that these events add glamour. As one extension soil conservationist remarked after observing the intense interest of a group in land judging: "The only other thing that would draw more interest would be a good dog fight."

This book will have its greatest value, I believe, as a reference in carrying out the local land judging events.

—W. R. TASCHER

APPROVED PRACTICES IN SOIL CONSERVATION: By A. B. Foster. 380 pp. Illustrated. 1955. Danville, Ill. The Interstate Printers and Publishers \$2.40.

HERE is a strictly brass tacks book: practical, usable, understandable. It deals with the techniques of planning, laying out, and applying accepted soil conservation practices. And it is the kind of book that intelligent farmers themselves can put to work. It is also convenient and reliable as a guide for teachers and leaders of field parties. Adding to its effectiveness as a manual is the fact that, although the book is in printed form it is equipped with a looseleaf binding which enables it to lie flat on a surface.

Approved Practices is condensed, thoroughly illustrated with halftones, charts, tables, and diagrams, and it is supported by both table of

contents and index. The text is pared to a discussion of essentials. Best of all, it is sound and authoritative, the output of a veteran in the Soil Conservation Service.

The author wisely states: "You should remember that many soil conservation practices require the help of men with specialized training and experience. I have tried to point out where this kind of help is needed as well as to describe those practices that you can handle under the supervision of your teacher. I have tried to present some of the difficult jobs and have suggested how far I think you can go and when you need the help of a specialist."

He mentions, too, that many things are being learned all the time about soil and water conservation—and that what is accepted today may be outdated tomorrow.

—WELLINGTON BRINK

POST PRESERVATION.—In the big open sagebrush and grass area of the Great Divide Soil Conservation District in northwestern Colorado fence posts are scarce. The source of juniper posts for this district once was about 50 miles away, now it is twice that far. In the mountains to the east, about 40 miles distant, are areas of aspen and pine. Posts from these species don't last very long without treating. In 1940 the SCS woodland conservationist, in western Colorado suggested trying to treat aspen posts with zinc chloride. A CCC side camp cut several thousand aspen posts, and while they were still fresh and green treated them with the "tire tube" method. These posts were used for many miles of fencing.

Last summer a check was made on the treated aspen posts. After 14 years, they were found to be 99 percent sound. Ponderosa pine or lodgepole pine posts, which are just as close as the aspen, would have done as well if they had been treated with pentachlorophenol ("penta"). Aspen has been considered worthless in the past because no markets existed for it in this area. Some folks are now beginning to wonder if it is really so worthless, after all. Preservative treatment of aspen and pine is moving the sources of fence post material closer to this soil conservation district.

—WILFRED S. SWENSON